Introduction to Physics and the Scientific Method

What is Physics?

- Physics is the study of the physical world
- This is a broad definition because of the nature of the topic
- Any problem that deals with temperature, size, motion, position, shape, or color involves physics

Areas Within Physics

- Mechanics: the study of motion and its causes and interactions between objects
- Thermodynamics: the study of heat and temperature
- Vibrations and Wave Phenomena: the study of specific types of repetitive motion
- Optics: the study of light
- Electromagnetism: the study of electricity, magnetism, and light
- Relativity: the study of particles moving at any speed, including very high speeds
- Quantum mechanics: the study of behavior of submicroscopic particles

The Scientific Method

- Developed by Galileo (16th Century Italy)
- Based on rational thinking and experimentation
- There is no one set procedure for science, but certain are steps common to all good scientific investigations

Steps of the Scientific Method

1. Make observations and collect data
2. Formulate a question
3. Hypothesize (scientific hypothesis)
4. Experiment to test hypothesis
5. Interpret results (re-hypothesize if necessary)
6. State conclusion in a form that can be evaluated by others

Other Terms

- Models (page 6): a pattern, plan, representation, or description designed to show the structure or workings of an object, system, or concept
- System: a set of particles or interacting components considered to be a distinct physical entity for the purpose of study.

Experimenting

- Controlled experiment: An experiment that tests only one factor at a time by using a comparison of a control group with an experimental group
- Was the boat activity a controlled experiment?